Debt Composition and Balance Sheet Effect of Currency Crisis in Indonesia

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(do not quote, suggestion welcome)

Abstract

The fashionable analysis of financial crisis accentuates on the role of corporate debt composition bearing the maturity and currency mismatch. Using 226 listed companies in Jakarta Stock Exchange, this paper investigates the role of currency and maturity mismatches in propagating the negative effects of currency depreciation. By nature, depreciation could enhance export performance by its "competitiveness effect", since price of goods should be cheaper. Nevertheless, due to the effects of maturity and currency mismatch, depreciation decreases net worth of the firms through "balance sheet effect". This paper focuses on the impact of currency depreciation on firm-level investment. By panel data analysis, we find that firms with more dollar debt invest less in both long and short-term investment. Unfortunately, this paper fails to provide empirical evidence on the impact of currency depreciation on firm-level investment and other firm performance. However, it seems that the extreme currency depreciation followed by financial and economic crisis destroys structurally investment condition in Indonesia. Therefore, even though currency depreciation is not related significantly to firm-level investment, it is likely not true that the depreciation does not matter on firm as well as economic performance.

Keyword: maturity mismatch, firm investment, balance sheet effect, financial crisis
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I. Introduction

The question of how such huge crisis happened in a fairly good macro economic performance in around Asian countries is still vibrant. Nowadays, it is widely accepted that the real problem of most Asian countries were not really on macro side, but in micro one. Krugman (1999) argue that by normal criteria, government budgets in around Asian countries were in good shape; current account deficits were large in Thailand and Malaysia, but relatively moderate in Korea and Indonesia; despite some slowdown in growth in 1996, there was not a strong case that any of the countries needed a devaluation for competitive or macroeconomic reasons.

The role of micro sector on the macro economic fragility becomes a prevalent analysis in the studies of crisis following a series of financial turmoil in around the world[2]. By employing the balance-sheet approach we can describe the impact of disturbances on the assets, liabilities and net worth of households, firms, government, and the economy as a whole and on the implications for growth and stability. Balance-sheet approach considers the micro side in explaining the macro fragility. It is indispensable to link micro sectors and macro economic performance.

For the case of Asian countries, there are several arguments behind the macro economic stability. The first is that underneath the apparent soundness of macroeconomic policy was a large, hidden subsidy to investment via implicit government guarantees to banks, cronies of politicians, etc (Krugman 1999). The apparent soundness of budgetary and macroeconomic policy was an illusion: under the surface, the governments were actually engaged in reckless and unsustainable spending. Meanwhile, Corsetti, Pesenti, and Roubini (1998) describe that implicit guarantees led banks to engage in moral hazard lending; it represented a hidden government budget deficit, and the unfunded liabilities of these banks represented a hidden government debt.

This paper intends to translate the balance sheet approach by bringing the empirical evidence on the relation of firm-level investment and the currency mismatch. The main question is whether firms with higher debts in foreign currency have less investment when the currency depreciation is present. We consider that the deterioration of firm balance sheets played a key role in the economic performance.

[2] In the decade of 1990s, waves of crisis hit regions around the world: the collapse of western European's Exchange Rate Mechanism in the fall of 1992, the collapse of the Mexican country in the winter 1994 -1995, and the East Asian countries in the mid of 1997-1998

There are two channels where firm-level performance will be undermined by currency depreciation. First, firms with high leverage in foreign currency will have low marginal propensity to import. Second large foreign currency debt with low revenue from export activities will reduce the net-worth of the firms. In short world, debt composition of the firms plays important role in propagating crisis.

In Indonesia, the 1997 currency depreciation is associated with poor performance due to unsound capital structures, where firms depend excessively on short-term bank loans to finance their longer-term projects. It bears the maturity mismatch. Meanwhile, the crisis reveals the vulnerabilities of using un-hedged short-term foreign currency borrowings to finance domestic investment projects. In latter case, the currency mismatch is present.

To investigate the effect of currency depreciation on the firm-level investment, this paper links directly the interaction of currency depreciation, debt composition and firm-level investment by using listed companies in Jakarta Stock Exchange (JSX). According to the maturity-mismatch hypothesis, firms with higher exposure in dollar debt should suffer more from the aggregate capital outflow. The main question of this paper is whether firms with higher dollar debt maturity have less investment due to currency depreciation in Indonesia. We use the standard reduced-form investment model to investigate the relation of the currency mismatch and firm-level investment. In this study we include 226 firms listed in the JSX in the period of 1994 – 2004. Panel data analysis is employed in this study.

II. Theoretical Overview

1. Balance Sheet Approach

Balance sheet approach focuses on the differences in the values of the foreign currency denominated assets and liabilities on the balance sheets of households, firms, the government and the economy as a whole. For a firm, the currency mismatch derives from the relationship between net foreign-currency denominated liabilities and the net present value of domestic-currency denominated cash flow. A firm with a currency mismatch will experience an adverse balance-sheet effect if exchange-rate depreciation raises the value of its net foreign-currency denominated liabilities relative to the net present value of its cash flow.

Following a series of crisis around the world balance sheet approach is considered as an appropriate tool of analysis. Huge research agenda employ this approach.

> Some studies focus on the net worth effects of shocks to the exchange rate in the presence of foreign currency denominated liabilities. Others look at liquidity or interest rate shocks when the tenor of a bank, firm or country's liabilities is shorter than the tenor of its assets. In some studies the propagation mechanism is the impact on consumption and investment of the change in net worth of households and non-financial firms. In others it is the impact on the liquidity and solvency of financial institutions and markets and hence on confidence in the financial system. In still others it is the impact on the sustainability of the public debt[3].

In conventional explanation, currency depreciation could enhance firm performance for tradable sector or sector which gains revenues in foreign currency for their production and sales activities. It is a "competitiveness effect" of the currency depreciation. But, in the case of firms highly indebted on the foreign liabilities, depreciation decreases net worth of the firms through "balance sheet effect". In this channel, firms with high foreign leverages should be suffering more in the case of the presence of currency depreciation. Due to financial globalization and currency fluctuation, firm financing policies contribute significantly on firm vulnerability.

The concern of this paper is actually on the choice of the financial structure of the firms and their impact on the firm investment around currency depreciation in Indonesia. To investigate the effect of currency depreciation on the firm-level investment behaviour, we link directly the debt composition of the firms and the level of investment. According to the maturity-mismatch hypothesis, firms with higher exposure in short-term debt should suffer more from the aggregate currency depreciation. Meanwhile, currency-mismatch hypothesis describe that firms with higher dollar debt should less investment after interaction with currency depreciation.

In most developing countries, excessive external debt of the corporate sector is due to the bank-dependency of the financing policies, which coincides with the weaknesses of the financial sector supervision and governance. In many Asian countries bank commonly offer credit more exclusively for the connected corporate sector. In Indonesia, at the onset of crisis, the credit approval is actually based on two principal reasons. For private banks, loan is preferably channelled to the related firms in the same groups or conglomerate. And for state banks, the relation revealed the memo-credit behaviour that means credit would be disbursed as if any references from high level of government officers or important political leaders. Banking and financial sector are actually lack of the good governance in the well-design institution arrangement. One of the implications is the absence of the risk assessment in the credit approval.

[3] Quoted from Eichengreen, Hausmann and Panizza (2005)

Firms with heavy short-term foreign currency-denominated debt become vulnerable to both exchange rate and interest rate shocks through currency and maturity mismatches. Bernanke, Gertler, and Gilchrist, (1999) explain that the soaring of interest rate can lead to a rollover risk and a decline in the net worth of the firms with higher short term debt magnifying the conventional interest rate channel as postulated by the financial accelerator mechanism.

In the so-called third generation crisis models, currency composition as well as maturity debt becomes a central problem, which could exacerbate the currency crisis. As noted by IMF (2005) "both currency and maturity mismatches can exacerbate the impact of exogenous shocks in emerging markets, increase the severity of crises, and slow down the post crisis adjustment".

One of the most important consequences of the financial crisis is the investment behaviour in firm level, which induces directly the economic growth. Froot, Sharfstein, and Stein (1993) develop a model in which the cost of financial distress is the loss of investment opportunities.

Many studies provide empirical evidence that maturity mismatch in emerging countries become one of the most important factor inducing financial fragility that ended by financial crisis. Before the period of crisis in Asia, most countries in the region preferred to employ external short-term debt, which become a problem when the depreciation of local currencies were present. Most of companies could no repay their debt, and many among them have to reduce their investment level if not liquidate. Since this phenomenon was common, on the aggregate level, economies become more fragile since the investment was collapse that coincided with the reversal of capital account.

Radelet and Sachs (1998) mention this condition as the financial panic where the liquidity holder preferred to move their investment into other currencies. However herd behaviour of the liquidity holders revealed the financial panic is sourced by the fundamental weaknesses of the economy. Corporate sector, which was highly leveraged become one of the source of the fundamental weakness, particularly that much of this indebtedness was at the short term.

Although this risk is microeconomic in nature, the evidence advanced thus far has taken the form of macro correlations (Bleakley and Cowan 2003). Firstly, this microeconomic risk will exacerbate the currency depreciation by considering the behaviour of financial panic and secondly this capital account reversal commonly would be accompanied with a decline in investment.

Several researches are concern on the issue of the balance sheet effects of the exchange rate depreciation. Aguiar (2002) using large listed firms in Mexico describe that there is a balance sheet effect mechanism. It is found that dollar debt and firm investment have significant negative correlation, which means that firms with higher dollar debt have smaller investment due to currency depreciation. Allayanis *et al*. (2003) find the same finding that firms with higher dollar debt invest less in depreciation period for the case of large listed companies in Asian countries (Hong Kong, South Korea, Indonesia, Philippines, Malaysia, Thailand and Taiwan). Bonomo *et al*. (2003) using large listed companies also find the same findings for the case of Brazil. Pratap *et al*. (2003) find the negative and significant relation of the dollar debt and firm-level investment in the case of Mexico.

Meanwhile Bleakley and Cowan (2002) find inversely that the relation is positive and significant in the case of Latin American countries (Argentina, Brazil, Chile, Colombia and Mexico). They explain that there is not balance sheet effect in which currency depreciation do not refrain the investment of firms indebted in dollar. In the case of Asian countries, Luengnaruemitchai (2003) finds comparably that the relation between dollar debt and firm investment is not significant.

Accordingly, debate on the balance sheet effect of the currency crisis is far from exhaustive since there are the conflicting evidences among different researches. This paper believes that empirical evidence in this issue is always challenging since further research program is always needed for development of the ideas.

2. Investment in Indonesia

Liberalization policies in Indonesia have been excessively implemented in the 1980s, due to the sharp declines in oil revenues in late 1982, and again in 1986. Facing such condition, Harris, Schiantarelli and Siregar (1992) identify two principal policies responses. First, non-oil exports had to be increased in order to maintain the flow of imports essential for continued development. Second, with the decline in oil revenues, fewer resources were now available to the public sector and therefore it became necessary to stimulate private savings mobilization.

Financial liberalization is an important momentum to bear financial fragility that finally ended by financial crisis. Capital account liberalization was supposed to stimulate growth in the developing world by channelling scarce capital to deserving economies and facilitating

international risk sharing (Eichengreen and Hausmann, 2003). But actually, the dream did not come true. Instead, they find that private financial markets have been engine of instability and since 1998 debt flows to developing countries have become negative. As we know in nowadays, after the series of crisis around the world, it seems that the international financial integration has not worked as promised.

In the mid of 1997, severe crisis hit Indonesia together with other neighbouring Asian countries, such as Thailand, South Korea, Malaysia and the Philippines. The major important impact of the crisis is on the economic growth, which drops dramatically in 1998 (-13 percent). It is due to the collapse of the investment of the real sector, especially the corporate sector.

In the aftermath of crisis, Indonesia comes upon low level of investment. Instead of expanding their investment firms prefer to consolidate their activities first. Firm-level investment was strongly impacted by tight money policy applied by Bank Indonesia in dealing with exchange rate volatility[4]. Following rapid currency depreciation in the mid of 1997, Bank Indonesia as the monetary authority in Indonesia enhanced interest rate into 70.44 percent on August 1998. In such condition, firm sector technically collapsed. Impact of currency crisis was huge on Indonesian economic performance: GDP contracted by 13 percent and inflation reached 58.5 percent in the end of 1998[5]. In the following years from the 1997 crisis, Indonesia's economy is subjected to poor performance.

After a long journey in severe crisis, investment in Indonesia is still under performing. Impact of crisis has been enduring a couple of years following a financial crisis. Even for exporter firms, depreciation could not enhance the competitiveness. In conventional trade theory, currency devaluation will stimulate export since the value of export should be cheaper or in other way domestic firms will have exchange rate competitiveness.

Since the value of the rupiah plummeted from around 2,000 rupiah to around 8,000 rupiah to the U.S. dollar, Indonesian exports should be comparatively inexpensive relative to pre-devaluation prices, however worldwide demand seemed steady, structural barriers to Indonesian

[4] Tight money policy employed by Bank Indonesia become a central debates until nowadays, since this policy is required by International Monetary Fund (IMF) who has a fallacy in his policies in line with really happen in Asian countries in the mid of crisis. For this issue, see Iwan Jaya Azis, "What Would Have Happened in Indonesia if Different Economic Policies Had Been Implemented When the Crisis Started?", *Asian Economic Papers,* volume 1, Issue 2, Spring 2002. And also Iwan Jaya Azis, "Modelling Crisis Evolution and Counterfactual Policy Simulations: A Country Case Study", *ADB Institute Working Paper Series*, No.23, August 2001

[5] In following years, economic activities in Indonesia were relatively slow by GDP growth of 0.2 percent in 1999 and 4.5 percent in 2000. Meanwhile, in 2001 GDP growth downed into 3.4 percent, and rebounded into 3.7 percent in 2002.

products appeared to be weakening and credit crunch that lead to financial constraints for corporate sector was present (Blalock and Roy, 2005).

III. Data and Methodology

We use database provided by JSX and ECFIN. We sort data of non-financial firms with at least 4 consecutive years. Surprisingly, there is no data of debt composition provided by both sources. However, they provide data of maturity debts. So that we construct manually debt composition by accessing directly the annual report of the firms. We have great difficulties for that, since debt composition of the firms do not reported in financial report. They are attached in note to the financial report.

First we documented foreign debt of the firms in various currencies and convert it in the local currency (Rupiah). We use rate published by Bank Indonesia. Then, all of financial ratio is deflated by wholesale price index (WPI) in 2000 for obtaining the current value. For this study we have 226 firms as samples in the period of study 1994 – 2004.

The main concern of this paper is whether firms with higher short-term and dollar exposure invest less in the aftermath of crisis. To do this, we run estimation procedures by employing reduced-form equation for investment. We apply Bleakley and Cowan's (2003) equation in capturing the interaction of (dollar) debt exposure and capital flows as written as follows.

$$(\text{Dollar debt exposure})_{i,t-1} \times (\text{Currency Depreciation})_t$$

Where i is firm and t is time.

Dependent variables are investments level of the firms, which proxied by investment in fixed assets and inventories. The main explanatory variable is debt exposure, which could be dollar debt or short-term debt, which is all liabilities coming due in the upcoming fiscal year.

We employ inventory as dependent variable since a shortage of working capital reduces firm capacity to purchase intermediate goods and pay for variable factors of production, leading to a reduction in output. The main macroeconomic variable employed in the present study is real exchange rate (RER).

To assess maturity structure on both sides of the balance sheet, we take the difference between short-term liabilities and current assets, which we call short-term exposure. And for currency mismatch we employ dollar debt liabilities and asset in foreign currency.

Specifically, we propose and implement a simple regression equation developed by Bleakley and Cowan (2003) that allows us to estimate different responses of the firms to currency depreciation with different maturity and composition structures of their balance sheet. The equation employed in the main estimation procedures is written as follows:

$$\frac{I_{it}}{TA_{it-1}} = \gamma\left(\frac{D^*_{it}}{TA_{it-1}}\Delta \log e_t\right) + \delta\frac{D^*_{it}}{TA_{it-1}} + \varphi\frac{D_{it}}{TA_{it-1}} + \alpha X_t^{macro} + \eta X_t^{micro} + \varepsilon_{it}$$

Where:

I = investment

D* = dollar debt

D = total debt

TA = total asset

log*e* = log of RER

IV. Empirical Evidence

1. Determinants of Debt

Our main concern is on the relation of debt composition and the firm-level investment. But we are also interested in the determinants of currency and maturity debts. By this evidences we can understand the behaviour of financing policies of the firms in Indonesia.

In table (1) we can find that current asset is positively related to short-term debt. It means that debt move with short-term asset in the firms. Firms use short-term collateral for gaining short-term liabilities. It is likely true that most firms in Indonesia are more indebted on short-term liabilities by guaranteeing their current asset. The evidence that total asset, which can be a proxy for long-term collateral is negatively related to short-term debt (even it is always not significant) can be important finding to confirm our hypothesis of the short-term debt exposure. Firm does not use long-term guarantee for their loans. In other world, firms in Indonesia have a highly current exposure, which can jeopardize the financial healthiness by enhancing the bankruptcy risk of the firms.

Total debt is positively and significantly related to short-term debt. More total debt means more short-term debt. It could be an important indicator that firms in Indonesia prefer to access short-term debt rather than long-term debt. This sign is also important in supporting our evidence that Indonesia firms are highly indebted in current exposure.

Unfortunately, earning is always negatively related to short-term debt. In panel (D) we can see that earning have negative correlation with short-term debt in -0.3330 with 99 percent of confidence. It means that less earning of the firms accompanied by more short-term debt. It is important indication of the bad performance of most firms in Indonesia due to the 1997 financial crisis. In such extreme depreciation, it is likely that most firms are technically collapses.

Table (2) shows the determinant of dollar debt. Interestingly, in most cases current asset is negatively related to dollar debt. In panel (A) and (B), the signs are positive but they are not significant. Panel (C), (D), (E) and (F) where several controlling variables are introduced, current asset have consistently negative correlation. In panel (C), the coefficient correlation is -03887 with 1 percent of significant level.

It is likely that most firms in Indonesia cannot provide even current guarantee in their loans in foreign currencies. Since the coefficient correlation of total asset is always not significant, it can be said that long-term guarantee do not matter on dollar debt. In other worlds, most firms in Indonesia do not utilize long-term guarantee for accessing foreign debts.

Like in the case of short-term debt, earning is negatively related to dollar debt. In panel (D), earning has -0.2121 coefficient correlation (significant in 1 percent) with dollar debt. Again, earning inversely relates to dollar debt. More dollar debt means less-earnings. It is due to the extreme currency depreciation.

It is also important to note that dummy of MNC have positive and significant relation with dollar debt (0.1609 in 99 percent confidence). Most firms with more than 50 percent foreign ownership naturally have more dollar debt. It is very natural evidence, since MNC has much more access to the foreign capital market or due to their parent financial supports in the case of currency crisis.

2. Main Results

The principal evidence provided by main result show that dollar debt exposure does not matter in both investments: long-term investment and short-term investment. Coefficient

correlation of the most regression of dollar debt exposure and investment level is not significant. It means that there is no significant relation between dollar debt exposure and investment. Currency depreciation does not matter on investment.

Bleakley and Cowan (2002) find that in Latin American countries, the dollar debt exposure does not significant but have positive sign. It means that firm with more dollar debt invest more in the presence of the currency depreciation. In Indonesia, meanwhile it is not significant the sign in core-regression is negative (-0.1254).

We use two dependent variables in investment, which are investment in fixed asset and inventories. The basic idea is to differentiate the impact of depreciation on short term and long-term investment. Investment in fixed asset is oriented on the long-term expansion of the productive capacity of the firms. Meanwhile inventories is a relatively shorter affair, therefore inventories is likely to be more sensitive to the availability of working capital and short-term financing.

The results of both regressions in fixed-asset investment and inventories are provided in Table (4) and (5). In table (4) the coefficient correlation changes to be positive when we introduce the controlling variables such as the interaction of total debt with depreciation, earning before tax and asset in dollar. These findings can be seen in panel (B), (C) and (D) in table (4). It is important to note that the coefficient correlation is smaller when we introduce several controlling variables. In panel (A), even though the interaction of dollar debt and the change in the exchange rate ($D^* \times \Delta e$) is not significant, we can support the finding by considering the coefficient correlation value of the dollar debt and the change of the exchange rate. In this panel (A), we can see that dollar debt is negatively related to firm investment in fixed asset (-0.0940) with 95 percent confidence. It leads us to understand that firm with higher dollar debt level less invest in their long-term investment.

In table (5) we find that the interaction of dollar debt and depreciation is negative in inventories (even though it is not significant). The coefficient changes when we introduce the variable of return (earning before tax). Dollar debt is negatively related on inventories (-0.0277), which mean that firm with higher dollar debt will expense less investment in short term. The finding is valid when we introduce several variables such as earning and asset in dollar, but the level of significance is smaller.

The main result of regression in both measurement of investment provides the comparable evidence. In these cases, we have weak evidence of the significant relation between dollar exposure and investment level. We can say that in Indonesia, the investment level of the firms is not influenced significantly by the currency mismatch. It may be due to the huge financial crisis that hit severely all companies not considered by their currency composition of debts.

3. Robustness Checks

For robustness check we employ regression procedures to investigate the effect of maturity mismatch and currency mismatch. For maturity mismatch we link directly the exposure of the short-term debt with investment level. And for currency mismatch we use the exposure of the dollar debt. The main result is not supported by findings. In table (6) and (7) where investment in fixed asset and inventories are linked to the dollar debt and short-term debt, we cannot find evidence supporting the main result. We just find that in panel (D) short-term debt, which interacts with bank credit, is negatively related to investment in fixed asset (-0.2893) with 99 level of confidence. It means that firms with higher short-term debt have smaller investment level due to their high debt level.

In term of investment in short-term measured by inventories, the interaction of short-term debt with the change of the exchange rate has positive correlation with investment. It means that firms having more short-term debt invest more in inventories around depreciation. This finding can be said to make-sense, since the most short-term debt is commonly used to fulfil the short-term investment. In panel (D), the interaction of short-term debt with bank credit has negative correlation with inventories (-0.1056) with 5 percent significant level.

Distinguishing the competitiveness effect and net worth effect precedes another robustness check. The competitiveness effect leads us to comprehend that exchange rate depreciation will give profit of the firms, since the output of the production of the firm in countries would be less expensive comparing to others countries. Currency depreciation should increase exporters' competitiveness and investment.

In table (8) we can see that the currency depreciation has positive correlation with sales (but it is not significant) and future earning. In panel (C), (D), (E) it is shown that currency depreciation is positively related to future earning (t+1). The coefficient correlation is 0.3657 with 1 percent of significant level. It means that firms with higher dollar debt earn more in the

next year. The result is robust since when we introduce several variables the result is consistent. In panel (E), when earning in the current period is introduced the coefficient correlation slightly augment into 0.3803 with 99 percent level of confidence.

Interestingly, currency depreciation is negatively related to earning in the current period (t), even though it is not significant. It is likely due to the highly volatile of currency depreciation, which degrade the current earning but not the next period. Overall, currency depreciation has negative correlation between total debt and all measurement of firms' competitiveness.

Some researches show important evidence concerning on weak performance of investment in Indonesia. Blalock and Roy (2005) who study the export puzzle find that a large number of pre-crisis exporters quit exporting even in the presence of a much more advantageous exchange rate. They conclude that the absence of a boom is the result of some constraints that prohibited many pre-crisis exporters from so many firms ceased exporting. In their research there is interesting evidence that better firms proxied by foreign ownership were more likely to continue exporting.

Another research conducted by Blalock, Gertler and Levine (2004) find that currency devaluation could not increase exporters' competitiveness and investment due to the collapse of banking system which deny to give credit to the firms sector. Under-investment in profitable condition leads an explanation that firms faced liquidity constraints. This is confirmed by the research of the team from Bank Indonesia that find that following a financial crisis the credit crunch is present in Indonesia[6]. They also indicate that only exporters with foreign ownership increased investment significantly. Exporters with foreign ownership can solve easily the lack of credit availability by accessing global capital market or demand aids from their parents or headquarters.

V. Conclusion

Due to financial crisis, firm investment in Indonesia performed poorly. It could be due to their debt composition jeopardizing the competitiveness by eroding their net worth. However, it

[6] See Agung Juda, Bambang Kusmiarso, Bambang Pramono, Erwin G. Hutapea, Andry Prasmuko, Nugroho Joko Prastowo, "Credit Crunch In Indonesia In the Aftermath of the Crisis: Facts, Causes and Policy Implications" *Working Paper*, 2000, Directorate of Economic Research and Monetary Policy Bank Indonesia, Bank Indonesia, Jakarta.

is also possible that financial crisis destroy structurally investment climate in Indonesia. This paper clarifies that the impact of debt composition on firm-level investment in Indonesia is relatively limited.

In this paper, dollar debt is negatively and significantly related to investment, but it is not significant on earning and future earning where the sign is positive. It could be dubious evidence. Unfortunately, this paper also fails to provide empirical evidence on the impact of the interaction of currency depreciation and debt composition on firm-level investment, sales and earning. The coefficient correlation is always not significant. Financing choice can explain partly the poor performance of investment due to financial crisis. But structural condition of investment in Indonesia should be considered in the analysis for better explanation of the poor performance of investment.

Accordingly, this paper has some limited explanations on the impact of the currency depreciation on the firm investment degradation. The possible interpretation of this empirical evidence is that the severe financial crisis deteriorates structural economic condition, which finally aggravates the investment climate in Indonesia. Our empirical evidence shows that the presence of currency depreciation does not explain the firm-level investment. Currency depreciation is not related significantly to firm-level investment, but it may matter on structural business environment, which finally induces firm investment.

However, empirical evidence on the determinants of dollar debt and short-term debt can be important evidence. In most cases, long-term guarantee does not matter on debts: short-term debt or dollar debt. Another important evidence is that in most cases, earning is negatively related to both short-term and dollar debt. By these evidences we can say that the capital structure of the firms in Indonesia is partly responsible on the poor performance of investment, even though we cannot provide empirical evidence of the effects of the currency depreciation on the debt composition and then firm-level investment.

This paper actually finds that in most cases, currency depreciation does not strongly explain the weak investment performance due to their financing choice. It should be other channel for explaining the relation of the financial crisis and firm-level performance behaviour. Even though the currency mismatch explanation has limitation, it seems that financial crisis degraded structural condition of investment. This paper does not address directly the latter issue, so that it should be done in further research.

This research employs relatively simple methodology, namely ordinary least square (OLS). In further research it should be developed more advance methodology such as generalized method of moments (GMM) for dynamic panel data. Meanwhile, data construction of debt composition should be improved in term of quality and quantity. Many firms of our sample in this study just have short time series of debt composition data. Manual works for longer period of data should be needed in further research**.

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Table 1. Summary of statistic

	Mean	Standard Deviation	Obs
Firm-level Variables			
Investment in fixed-asset	0.0541	0.8834	1751
Inventories	0.2052	1.2433	1750
Short-term Debt	0.5152	1.0175	1751
Dollar Debt	0.4805	6.1919	1752
Total Debt	0.7724	1.5248	1752
Lag of Short-term Debt	0.4905	0.5285	1750
Lag of Dollar Debt	0.3191	0.4643	1751
Lag of Total Debt	0.7084	0.5564	1751
Current Asset	0.5102	1.7877	1752
Dollar Asset	0.7518	17.7784	1752
Earning	0.0234	0.3263	1752
Earning (t+1)	0.0260	0.6783	1749
Macro Variables			
Delta log RER	0.0186	0.2286	1880
Delta Inflow of Credit (% Nominal GDP)	-0.0119	0.0269	2068
Delta log Bank Credit	-0.0999	0.3087	1880
Micro - Macro Interaction			
Dollar Debt x (Delta log RER)	-0.0314	2.3711	1738
Total Debt x (Delta log RER)	0.0350	0.4619	1738
Dollar Debt x (Delta Inflow of Credit)	-0.0062	0.0219	1738
Total Debt x (Delta Inflow of Credit)	-0.0134	0.0998	1738
Dollar Debt x (Delta log Bank Credit)	-0.0452	1.2815	1738
Total Debt x (Delta log Bank Credit)	-0.0377	1.1303	1738

Table 2. Determinants of Short-term Debt

	Dependent Variable: Short-term Debt					
Independent Variables						
Current Asset	0.9742 ***	0.9921 ***	0.0768 **	0.1535 ***	0.1536 ***	0.1544 ***
	0.0514	0.0561	0.0406	0.0431	0.0431	0.0432
Log Total Asset		-0.0458	-0.0040	-0.0240	-0.0242	-0.0225
		0.0421	0.0248	0.0248	0.0248	0.0250
Total Debt			0.8266 ***	0.7925 ***	0.7925 ***	0.7926 ***
			0.0213	0.0222	0.0222	0.0223
Earning				-0.3330 ***	-0.3332 ***	-0.3290 ***
				0.0692	0.0692	0.0697
Asset in dollar					-0.0004	-0.0004
					0.0025	0.0025
Dummy of MNC						0.0389
						0.0734
N	1751	1734	1734	1734	1734	1733
R^2	0.3079	0.3025	0.7589	0.7658	0.7658	0.7658

Table 3. Determinants of Dollar Debt

	Dependent Variable: Dollar Debt					
Independent Variables						
Current Asset	0.0527	0.0242	-0.3887 ***	-0.3399 ***	-0.3406 ***	-0.3407 ***
	0.0429	0.0464	0.0513	0.0550	0.0551	0.0551
Log Total Asset		0.0057	0.0249	0.0123	0.0129	0.0188
		0.0346	0.0311	0.0315	0.0315	0.0317
Total Debt			0.3730 ***	0.3513 ***	0.3514 ***	0.3533 ***
			0.0270	0.0284	0.0284	0.0284
Earning				-0.2121 ***	-0.2114 ***	-0.1953 ***
				0.0884	0.0885	0.0889
Asset in dollar					0.0015	0.0015
					0.0032	0.0032
Dummy of MNC						0.1609 ***
						0.0936
N	1752	1735	1735	1735	1735	1734
R^2	0.0019	0.0005	0.1945	0.2003	0.2005	0.2026

*, **, *** denote significance at the 10 percent, 5 percent and 1 percent levels, respectively

Table 4. Main Result

	Dependent Variable: Investment in Fixed Asset			
Independent Variables	A	B	C	D
Dollar Debt x (Delta log RER)	-0.1254	0.0208	0.0444	0.0441
	0.2244	0.2780	0.2766	0.2767
Total Debt	-0.0572	-0.0802	-0.0517	-0.0516
	0.0547	0.0605	0.0608	0.0609
Dollar Debt	-0.0940 **	-0.0792	-0.0823 *	-0.0824 *
	0.0550	0.0574	0.0571	0.0571
Delta log RER	0.1576 **	0.2817 **	0.2602 *	0.2607 *
	0.0943	0.1683	0.1675	0.1676
Total Debt x (Delta log RER)		-0.2543	-0.1202	-0.1205
		0.2855	0.2870	0.2872
EBT			0.4196 ***	0.4199 ***
			0,1318	0.1318
Asset in dollar				0.0018
				0.0049
N	1747	1747	1747	1747
R^2	0.0166	0.0175	0.0298	0.0300

*, **, *** denote significance at the 10 percent, 5 percent and 1 percent levels, respectively

Table 5. Main Result

	Dependent Variables: Investment in Inventories			
Independent Variables	A	B	C	D
Dollar Debt x (Delta log RER)	-0.0310	-0.0024	0.0031	0.0030
	0.0669	0.0830	0.0827	0.0828
Total Debt	-0.0027	-0.0072	-0.0005	-0.0005
	0.0163	0.0181	0.0182	0.0182
Dollar Debt	-0.0277 **	-0.0248 *	-0.0255 *	-0.0255 *
	0.0164	0.0171	0.0171	0.0171
Delta log RER	0.0667 ***	0.0910 **	0.0860 **	0.0861 **
	0.0281	0.0502	0.0501	0.0501
Total Debt x (Delta log RER)		-0.0497	-0.0184	-0.0185
		0.0852	0.0859	0.0859
EBT			0.0981 ***	0.0982 ***
			0.0394	0.0394
Asset in dollar				0.0006
				0.0015

N	1746	1746	1746	1746
R^2	0.0164	0.0168	0.0244	0.0246

*, **, *** denote significance at the 10 percent, 5 percent and 1 percent levels, respectively

Table 6. Maturity and Currency Mismatch

	Investment in Fixed Asset				
	A	B	C	D	
Dollar Debt x (Delta log RER)	0.2203	0.1067	0.1209	-0.1044	
	0.1878	0.2443	0.2572	0.3351	
Dollar Debt x (Inflow of Credit)			0.5251	2.3132	
			1.5588	1.9262	
Dollar Debt x (Delta log Bank Credit)				0.3246	*
				0.2127	
Short-term Debt x (Delta log RER)		0.1269	0.1754	0.3165	*
		0.1785	0.1946	0.2111	
Short-term Debt x (Inflow of Credit)			1.0262	-0.7289	
			1.3611	1.6891	
Short-term Debt x (Delta log Bank Credit)				-0.2893	***
				0.1647	
N	1747	1746	1746	1746	
R^2	0.0164	0.0023	0.0058	0.0100	

*, **, *** denote significance at the 10 percent, 5 percent and 1 percent levels, respectively

Table 7. Maturity and Currency Mismatch

	Investment in Inventories							
	A		B		C		D	
Dollar Debt x (Delta log RER)	0.0858	*	0.0093		0.0132		-0.0189	
	0.0560		0.0729		0.0769		0.1001	
Dollar Debt x (Inflow of Credit)					0.1202		0.5662	
					0.4658		0.5751	
Dollar Debt x (Delta log Bank Credit)							0.0779	
							0.0635	
Short-term Debt x (Delta log RER)			0.0873	**	0.0950	**	0.1479	***
			0.0533		0.0581		0.0630	
Short-term Debt x (Inflow of Credit)					0.1685		-0.4743	
					0.4067		0.5043	
Short-term Debt x (Delta log Bank Credit)							-0.1056	**
							0.0492	
N	1746		1745		1745		1745	
R^2	0.0029		0.0063		0.0076		0.0133	

*, **, *** denote significance at the 10 percent, 5 percent and 1 percent levels, respectively

Table 8. Competitiveness Effects

	Sales	Earning	Earning (t+1)		
	A	B	C	D	E
Interaction Effect					
Dollar Debt x (Delta log RER)	0.1674	-0.0784	0.3657 ***	0.3657 ***	0.3803 ***
	0.3455	0.0715	0.0804	0.0805	0.0793
Main Effects					
Total Debt	0.0225	-0.0621 ***	0.0188	0.0189	0.0309 **
	0.0739	0.0153	0.0172	0.0172	0.0171
Dollar Debt	-0.0640	0.0029	0.0146	0.0148	0.0140
	0.0715	0.0148	0.0166	0.0167	0.0164
Controls					
Total Debt x (Delta log RER)	-0.2072	-0.2476 ***	-0.2490 ***	-0.2490 ***	-0.2004 ***
	0.2062	0.0427	0.0480	0.0481	0.0483
Fixed-Capital Investment (period t)				-0.0028	
				0.0138	
Inventory Investment (period t)				0.0193	
				0.0463	
Earnings (period t)					0.1956 ***
					0.0397
N	1748	1748	1745	1744	1745
R^2	0.0026	0.0987	0.0468	0.0468	0.0749

*, **, *** denote significance at the 10 percent, 5 percent and 1 percent levels, respectively